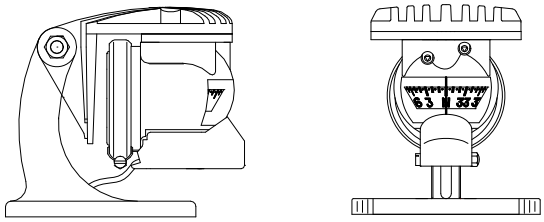
The 'NAVIGATOR' Compass - 'NV-2400 Series'- Operating Instructions



Ref: – OP/NV-2400/01 Iss:2

The **NAVIGATOR - 2400** is a precision compass suitable for installation into Light Aircraft. To obtain the optimum performance you should ensure that you carry out the following instructions carefully. We advise you to read through these instructions and notes before attempting to mount the unit in your aircraft.

THE COMPASS

The **NAVIGATOR - 2400** compass is provided with a magnetic compensating system, which will enable you to minimise the magnetic disturbances created by the mechanical and electrical characteristics of your aircraft.

The Compass Card is graduated in 5-degree increments with cardinal points at N, S, E & W. Because of the limited space available, the markings between the cardinal points should be multiplied by a factor of 10. i.e. 3 = 30 degrees, 24 = 240 degrees etc.

The level of the compass – Front to Back – can be adjusted by loosening the rear screw and rotating the compass about the swivel point. The screw should be re-tightened after adjustment.

POSITION OF MOUNTING

The compass should be mounted centrally on top of the 'Coaming' and attached with 3 'Non-Magnetic' screws of diameter no greater than 4mm (0.156").

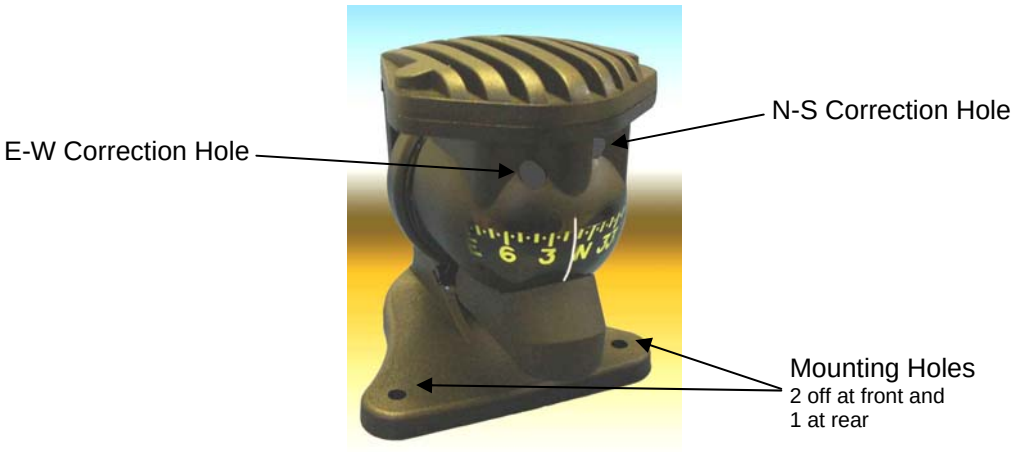


Fig 1

Before finalising the mounting point, it is a good idea to temporarily mount the compass in its intended position and "Swing" the aircraft to see if the initial deviations are less than 30 degrees. *If the deviation for each cardinal point is less than 30 degrees then proceed with the mounting procedure described below. If the errors are greater than 30 degrees, then try mounting the compass in a different position. If this does not resolve the problem, local de-gaussing may be required to reduce the disturbing magnetic influence.*

ADJUSTING YOUR COMPASS

Before your compass can be adjusted the aircraft must be capable of being aligned to both the East /West axis and North/South axis.
The use of another compass outside the aircraft, to determine the cardinal points is advised.

These following notes should be used for initial installation **guidance only**, the corrections should be checked or made by a **qualified Compass Adjuster** before flying.

CORRECTION EAST/WEST ('B' Coefficient)

1) Align your aircraft facing East, insert the Corrector Key provided, into the Left hand hole at the front of the compass, rotate the key in either direction so that the East point is directly under the Index line.
2) Align your aircraft facing west and check that the West Point is under the Index line, Any error may be corrected by readjusting to remove **HALF** the error shown.

CORRECTION NORTH/SOUTH ('C' Coefficient)

1) Align your aircraft facing North, insert the Corrector Key into the Right hand hole at the front of the compass, rotate the key in either direction so that the North point is directly under the Index line.
2) Align your aircraft facing South and check that the South point is under the Index Line. Any error may be corrected by readjusting to remove **HALF** the error shown
.

The above procedures can be repeated until the errors are minimised.

If the adjustments detailed above result in consistent errors on each of the Cardinal points the compass may not be aligned correctly on the Fore and Aft line of the aircraft, to correct this mis-alignment proceed as follows: -

SIRS NAVIGATION
Compass House • Bowes Estate • Wrotham Road • Meopham • Kent • DA13 0QB • England
Tel: 44(0)1474-816320 Fax: 44(0)1474-816321 email: sales@sirs.co.uk website: www.sirs.co.uk:

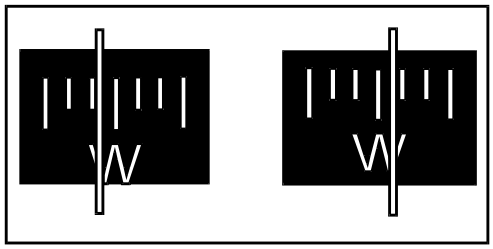


Fig 2 **Fig 3**

CORRECTION FOR MIS-ALIGNMENT ('a' Coefficient)

Only follow this procedure if the results obtained so far do not reach or requirements.

1) Align the aircraft facing North; record the compass error in Box A.
2) Align the aircraft facing South; record the compass error in Box B.
3) Align the aircraft facing East, record the compass error in Box C.
4) Align the aircraft facing West; record the compass error in Box D.

Note:

Errors to the Left of the true heading should be prefixed with a plus sign (+). **[Fig 2]**
Errors to the right of the true reading should be prefixed with a minus sign (-). **[Fig 3}**

5) Add the readings in Boxes A to D, enter the result in Box E. Divide the figure in Box E by 4, record the result in Box F, this figure is the error due to mis-alignment and may be corrected as follows.

Note the current magnetic heading, carefully loosen the two cross headed screws which secure the compass to the bracket, rotate the compass body in the opposite direction to the error shown in Box F. i.e. If the error in.Box F is +5 degrees, rotate the compass body by -5 degrees and vice versa. Carefully tighten the two cross-headed screws without moving the compass body

CORRECTION TABLE

In this example the compass body would need to be rotated by -5 degrees

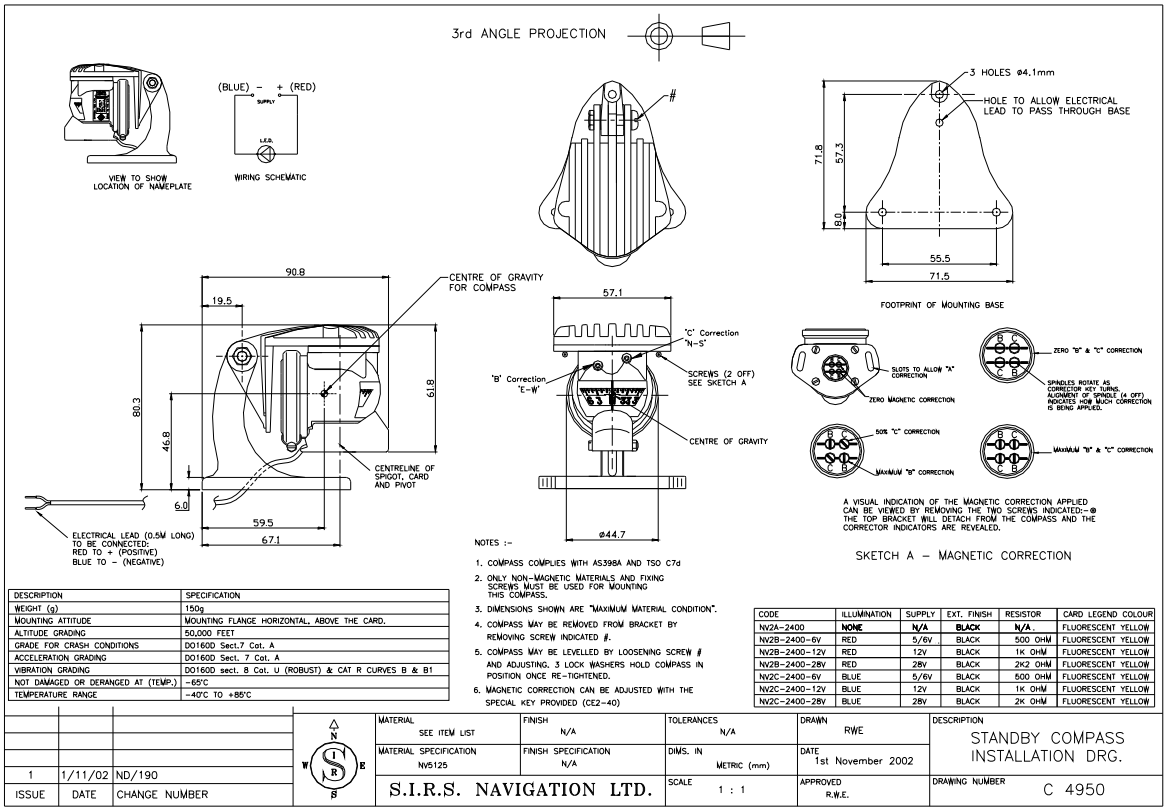
If having carried out these procedures the results are not satisfactory a new location must be found. Before this can be done the **NAVIGATOR** must be returned to it's ZERO status by carrying out the following procedure.

BOX	Sample Error	BOX	ACTUAL ERROR
A (NORTH)	+15	**A**	
B (SOUTH)	+5	**B**	
C (EAST)	-10	**C**	
D (WEST)	+10	**D**	
E (TOTAL)	+20	**E**	
F ("**E**" / 4)	+5	**F**	

1) Remove the **NAVIGATOR** from the bracket by removing the two cross-headed screws, this will reveal the top plate with its four spindles with white lines across.

Using the key provided rotate the spindles until all the white lines are parallel across the top plate, this is the ZERO CORRECTION status

3) Choose another location for the **NAVIGATOR** and repeat the installation procedure.


3rd ANGLE PROJECTION
VIEW TO SHOW LOCATION OF NAMEPLATE
(BLUE) – + (RED)
WIRING SCHEMATIC
3 HOLES ø4.1mm
HOLE TO ALLOW ELECTRICAL LEAD TO PASS THROUGH BASE
FOOTPRINT OF MOUNTING BASE
CENTRE OF GRAVITY FOR COMPASS
CENTRELINE OF SPIGOT, CARD AND PIVOT
ELECTRICAL LEAD (0.5M LONG) TO BE CONNECTED: RED TO + (POSITIVE) BLUE TO – (NEGATIVE)
'C' Correction 'N–S'
'B' Correction 'E–W'
SCREWS (2 OFF) SEE SKETCH A
CENTRE OF GRAVITY
ø44.7
SLOTS TO ALLOW "A" CORRECTION
ZERO MAGNETIC CORRECTION
ZERO "B" & "C" CORRECTION
SPINDLES ROTATE AS CORRECTOR KEY TURNS. ALIGNMENT OF SPINDLE (4 OFF) INDICATES HOW MUCH CORRECTION IS BEING APPLIED.
50% "C" CORRECTION
MAXIMUM "B" CORRECTION
MAXIMUM "B" & "C" CORRECTION
A VISUAL INDICATION OF THE MAGNETIC CORRECTION APPLIED CAN BE VIEWED BY REMOVING THE TWO SCREWS INDICATED ⊖ ⊕ THE TOP BRACKET WILL DETACH FROM THE COMPASS AND THE CORRECTOR INDICATORS ARE REVEALED.
SKETCH A – MAGNETIC CORRECTION
NOTES :-
1. COMPASS COMPLIES WITH AS398A AND TSO C7d
2. ONLY NON-MAGNETIC MATERIALS AND FIXING SCREWS MUST BE USED FOR MOUNTING THIS COMPASS.
3. DIMENSIONS SHOWN ARE "MAXIMUM MATERIAL CONDITION".
4. COMPASS MAY BE REMOVED FROM BRACKET BY REMOVING SCREW INDICATED #.
5. COMPASS MAY BE LEVELLED BY LOOSENING SCREW # AND ADJUSTING. 3 LOCK WASHERS HOLD COMPASS IN POSITION ONCE RE-TIGHTENED.
6. MAGNETIC CORRECTION CAN BE ADJUSTED WITH THE SPECIAL KEY PROVIDED (CE2-40)
DESCRIPTION | SPECIFICATION
WEIGHT (g) | 150g
MOUNTING ATTITUDE | MOUNTING FLANGE HORIZONTAL, ABOVE THE CARD.
ALTITUDE GRADING | 50,000 FEET
GRADE FOR CRASH CONDITIONS | DO160D Sect.7 Cat. A
ACCELERATION GRADING | DO160D Sect. 7 Cat. A
VIBRATION GRADING | DO160D sect. 8 Cat. U (ROBUST) & CAT R CURVES B & B1
NOT DAMAGED OR DERANGED AT (TEMP.) | –65°C
TEMPERATURE RANGE | –40°C TO +85°C
CODE | ILLUMINATION | SUPPLY | EXT. FINISH | RESISTOR | CARD LEGEND COLOUR
NV2A–2400 | NONE | N/A | BLACK | N/A. | FLUORESCENT YELLOW
NV2B–2400–6V | RED | 5/6V | BLACK | 500 OHM | FLUORESCENT YELLOW
NV2B–2400–12V | RED | 12V | BLACK | 1K OHM | FLUORESCENT YELLOW
NV2B–2400–28V | RED | 28V | BLACK | 2K2 OHM | FLUORESCENT YELLOW
NV2C–2400–6V | BLUE | 5/6V | BLACK | 500 OHM | FLUORESCENT YELLOW
NV2C–2400–12V | BLUE | 12V | BLACK | 1K OHM | FLUORESCENT YELLOW
NV2C–2400–28V | BLUE | 28V | BLACK | 2K OHM | FLUORESCENT YELLOW
1 | 1/11/02 | ND/190
ISSUE | DATE | CHANGE NUMBER
MATERIAL: SEE ITEM LIST | FINISH: N/A | TOLERANCES: N/A | DRAWN: RWE
MATERIAL SPECIFICATION: NV5125 | FINISH SPECIFICATION: N/A | DIMS. IN: METRIC (mm) | DATE: 1st November 2002
S.I.R.S. NAVIGATION LTD. | SCALE: 1 : 1 | APPROVED: R.W.E.
DESCRIPTION: STANDBY COMPASS INSTALLATION DRG.
DRAWING NUMBER: C 4950